

Hali-Brite®

Installation and Maintenance Manual

RCM-D Runway Closure Marker LED Version

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1 Introduction

About This Manual

The information in this manual is provided to assist installation and maintenance personnel in the proper installation and maintenance of the Hali-Brite® RCM-D Runway Closure Marker. This manual also includes installation and maintenance instructions for all equipment sold as options to the basic unit.

Limited Warranty

Warranty coverage for the RCM-D engine and generator is provided by their respective manufacturers, Mitsubishi and Marathon. Warranty coverage for all other components is provided by Hali-Brite®, Inc. These warranty coverages are described below.

Engine

The Mitsubishi diesel engine is covered for up to 3 years and/or 3000 engine hours. Consumables such as spark plugs and filters are not covered. Please see the enclosed Engine Warranty Summary for the exact details of this coverage. Contact Hali-Brite® to initiate engine warranty service.

Generator

The generator warranty coverage is provided by the Marathon Electric Manufacturing Corporation. The warranty coverage is one (1) year, unlimited hours, and two (2) years/2000 hours. All generator parts are covered except the capacitor. Please see the separately enclosed Generator Service Manual for further information. Contact the manufacturer directly to initiate warranty service.

RCM-D Components (excluding engine and generator)

RCM-D components are guaranteed against mechanical, electrical, and physical defects (excluding consumables) for a period of one year from the date of installation or a maximum of two years from the date of shipment and are guaranteed to be merchantable and fit for the ordinary purposes for which such products are made. In addition, lamp assemblies have a four year warranty, from date of installation. Hali-Brite® will correct by repair or replacement, at its option, equipment or parts which fail because of mechanical, electrical or physical defects, provided that the goods have been properly handled and stored prior to installation, properly installed and properly operated after installation, and provided further that the Buyer gives Hali-Brite® written notice of such defects after delivery of the goods to Buyer. Hali-Brite® reserves the right to examine goods upon which a claim is made. Said goods must be presented in the same condition as when the defect therein was discovered. Hali-Brite® further reserves the right to require the return of such goods to establish any claim. Hali-Brite®'s obligation under this warranty is limited to making repair or replacement within a reasonable time after receipt of such written notice and does not include any other costs such as the cost of removal of defective part, installation of repaired product, labor or consequential damages of any kind, the exclusive remedy being to require such new parts to be furnished. Hali-Brite®'s liability under no circumstances will exceed the contract price of goods claimed to be defective. Any returns under this guarantee are to be on a transportation charges prepaid basis. For products not manufactured by, but sold by Hali-Brite®, warranty is limited to that extended by the original manufacturer. This is Hali-Brite®'s sole guarantee and warranty with respect to the goods; there are no express warranties or warranties of

fitness for any particular purpose or any implied warranties of fitness for any particular purpose or any implied warranties other than those made expressly herein. All such warranties are expressly disclaimed.

Hali-Brite®'s warranty will not apply to any products that have been "so repaired or altered outside the manufacturer's plants as, in the manufacturer's judgment, to effect its reliability and performance."

No warranties, express or implied, including warranties of fitness for a particular purpose or merchantability, or warranties arising from course or dealing or usage of trade, are made regarding the information, recommendations, and descriptions contained herein. The manufacturer is not responsible and will not be held liable in contract or in tort (including negligence) for any special, indirect or consequential damages, including injury or damage caused to vehicles, contents or persons, by reason of the installation of any Hali-Brite® product or its mechanical or electrical failure.

Disclaimers

This manual is published for informational purposes only and the information provided should not be considered as all-inclusive or covering all contingencies. If further information is required, Hali-Brite®, Inc. should be contacted.

Details and values given in this manual are average values and have been compiled with care. They are not binding, however, and Hali-Brite® disclaims any liability for damages or detriments suffered as a result of reliance on the information given herein or the use of products, processes or equipment to which this manual refers. No warranty is made that the use of the information or of the products, processes or equipment to which this manual refers will not infringe any third party's patents or rights. The information given does not release the buyer from making his or her own experiments and tests.

2 Safety Precautions

To help you install and maintain this equipment safely and efficiently make sure you read and understand all safety information in this manual prior to performing any procedure. Failure to do so may result in personal injury, property damage, or possible death.

Safety Statements

The following safety statements are used throughout this manual. They will alert you to possible safety hazards and conditions that could result in personal injury, death, or property and equipment damage.

CAUTION: Indicates hazards or unsafe practices that could result in minor personal injury, product, or property damage.

WARNING: Indicates hazards or unsafe practices that could result in severe personal injury or death.

DANGER: Indicates immediate hazards that will result in severe personal injury or death.

General Practices

Read and become familiar with the general safety instructions provided in this section of the manual before installing, operating, maintaining, or repairing this equipment.

- Do not attempt to assemble or install this equipment if it has been damaged from shipping.
- Do not attempt to install or maintain this equipment if you or the equipment is standing in water.
- Only qualified personnel should perform maintenance on this equipment.
- Always use proper tools (as mentioned in this manual) to perform installation and maintenance.
- Use caution when cranking the jacks. Always crank slowly and grasp the handle securely.
- Use proper hand and eye protection as needed when installing or maintaining this equipment.
- Make sure you have adequate first aid supplies available when installing this equipment.
- Do not modify this equipment as this could create a safety hazard and void your Hali-Brite® warranty.
- Only use Hali-Brite® replacement parts.
- Read and carefully follow the instructions given throughout this manual for performing specific tasks and working with specific equipment.
- Follow all applicable safety procedures required by your company, industry standards, and government or other regulatory agencies.
- Make sure all equipment is rated and approved for the environment in which you are using it.
- Follow all instructions for installing components and accessories.
- Protect components from damage, wear, and harsh environment conditions.
- Allow ample room for maintenance, wiring accessibility, and cover removal.

Electrical Practices

- Do not attempt to make electrical connections with the power on.

- Disconnect and lock out electrical power before touching any electrical connections.
- Install all electrical connections to local code.
- Use only electrical wire of sufficient gauge and insulation to handle the rated current demand. All wiring must meet local codes.
- Route electrical wiring along a protected path. Make sure moving equipment will not damage it.
- Protect equipment with safety devices as specified by applicable safety regulations.
- If safety devices must be removed for installation, install them immediately after the work is completed and check them for proper functioning.
- Always use rated electrical tools when performing electrical work.
- Always make sure electrical connections are tight.
- Make sure electrical covers are in place after installation.
- Do not touch hot lamps with bare hands.

Qualified Personnel

Qualified personnel are those that are trained and experienced with installing or maintaining Hali-Brite® equipment. Only qualified personnel should install or maintain Hali-Brite® equipment and auxiliary features.

No one should:

- Attempt to install or perform maintenance on this or any Hali-Brite® equipment if they are physically impaired or under the influence of alcohol or non-prescription drugs.
- Maintain or install this equipment without correct training, supervision or experience in mechanical or electrical equipment.
- Attempt to maintain or install this equipment without the correct tools as specified in this manual.

Proper Usage

Always use this equipment as specified in this manual. Improper usage may result in serious personal injury, property damage, or possible death.

- Do not modify any equipment that has not been recommended by Hali-Brite®.
- Do not use any replacement parts that are not purchased from Hali-Brite®.
- Hali-Brite® cannot be responsible for injuries or damages resulting from non- standard, unintended applications of its equipment. This equipment is designed and intended only for the purpose described in this manual. Uses not described in this manual are considered unintended uses and may result in serious personal injury, death, or property damage.

3 Specifications and Major Components

Introduction

The RCM-D is a lighted visual aid that indicates a runway closure. It consists of a lighted “X”, with 14-foot arms, mounted to the chassis of a towable diesel generator.

The RCM-D is ETL-certified to comply with FAA Advisory Circular 150/5345-55, Category L-893(L).

Description

A 3-cylinder, liquid-cooled, trailer-mounted diesel generator provides 120VAC for the light assembly, as well as auxiliary power for other equipment.

The light assembly contains 24 lamps mounted to a 14-foot by 14-foot aluminum frame, constructed in the shape of an “X”. Twenty of the lamps face forward, and 4 lamps face to the rear for monitoring purposes. All lamps in each of the 2 arms are wired in parallel, and are connected to a control box mounted near the center of the X.

The lamps are operated at full intensity during daylight conditions, and are dimmed for night operation.

The light assembly control box, mounted at the center of the

light assembly, houses the photocell and photocell bypass switch. The photocell automatically reduces the lamp intensity under low ambient light conditions. The photocell dimming can be deactivated by turning off the photocell switch located on the side of the control box.

An additional control assembly, mounted inside the engine compartment, houses the flasher, flasher bypass relay, and day/night dimming relay.

The lamp flasher is factory-adjusted for 2.5 seconds on, 2.5 seconds off. The flasher is a solid-state device, and has no mechanical contacts. In the event that the flasher fails, the lamps will be turned on continuously.

A lamp is mounted on the rear of each light assembly arm to allow visual monitoring from the rear side.

Power is distributed to the light assembly control box by a cable and twist-lock connector attached to the generator control panel.

Specifications

Light Assembly

1. Arm dimensions: 14 ft diagonal, 10 ft vertical
2. Front lamps: (20) LED lamp modules
3. Rear monitor lamps: (4) LED lamp modules
4. Effective intensity: 70,000 cd center-beam
5. Lamp Beam Angle: 20 degrees (to half-intensity)
6. Lamp life: 50,000 hours typical
7. Flash rate: 2.5 sec on/2.5 sec off
8. Flasher type: Solid-state switch
9. Flasher bypass: Yes
10. Frame: 4" x 4" aluminum tubing
11. Paint: Yellow epoxy powder-coat
12. Photocell: Dims lamps during night operation
13. Photocell override: Yes
14. Elevation angle: Adjustable 0-10 degrees
15. Power: 650W, 700VA MAX, AT 120VAC

Engine

1. Manufacturer: Mitsubishi
2. Model: L3E-W261ML
3. Speed: 1800 RPM
4. Type: Diesel, 3-cylinder, liquid-cooled
5. Horsepower: 12.7 Hp at 1800 RPM
6. Fuel Consumption: 0.4 gallons per hour at full load
7. Start/Charging: Electric starter, alternator
8. Battery 12V
9. Low Oil Shutdown
10. High Temp Shutdown
11. Engine Hour Meter
12. Glow Plug

Generator

1. Manufacturer: Marathon Electric
2. Type: 4-pole, brushless
3. Model: 332CSA5214
4. Output power: 6.0 kW
5. Power Factor: 1.0
6. Frequency: 60 Hz
7. Output voltage: 120/240V, single phase
8. Output current: 50/25A

Chassis

1. 2200 lb. axle
2. 2" ball hitch
3. Four 2000 lb. leveling jacks
4. Side jack outriggers, 11 foot-6 inch span
5. DOT-compliant marker and tail lights
6. ST175/80D13 highway-rated tires
7. Safety chains with hooks
8. All steel tubing construction
9. Powder-coated steel engine housing
10. Lockable engine cabinet doors
11. External emergency engine stop
12. Removable trailer drawbar

AC Distribution

1. Main Circuit Breaker: 30A, 2-pole
2. 240V Heater/Lamp Breaker: 30A, 1-pole
3. 120V Outlet Breakers: 20A (2)
4. 240V Twist-Loc: 1 receptacle
5. 120V GFI Duplex: 2 receptacles

Capacities

1. Fuel Tank: 57 gallons
2. Run Time: 140 hr (RCM-D only)
3. Coolant: 4.5 qt.
4. Engine oil: 3.5 qt.

Size and Weight

1. Dimensions: 114”L x 65”W x 68”H
2. Dry Weight: 1265 lbs.
3. Shipping Weight: 1450 lbs. (palletized)

Environmental Specifications

1. Operating temperature: -40° F to 116° F
2. Operating humidity: 0 to 100%

Optional Equipment

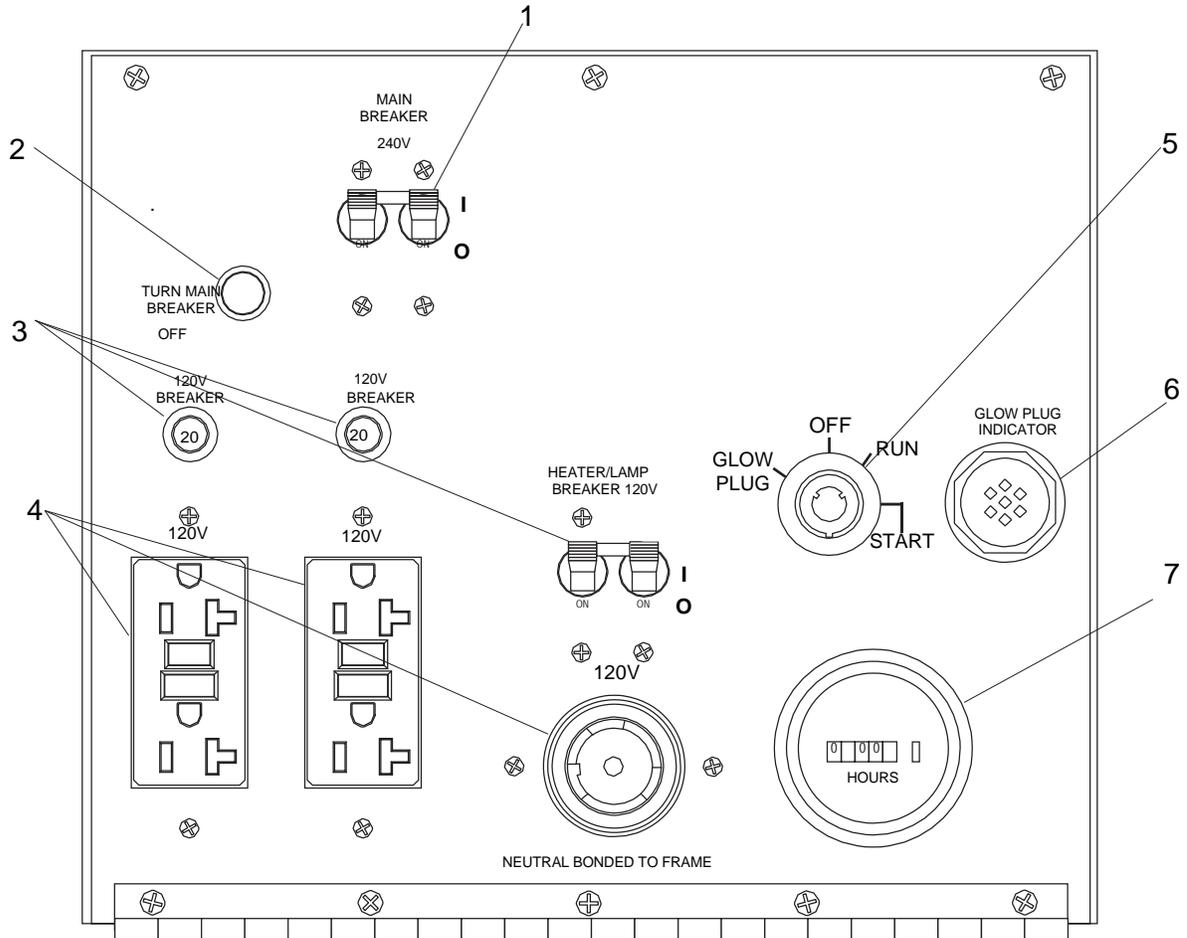
1. 2 ½” Pintle Hitch
2. Combination 2” Ball and 2 ½” Pintle Hitch
3. Rear Ball Hitch
4. Protective Cover
5. Gel Cell Battery
6. Electronic voltage regulator

Major Components

Generator Control Panel

The Generator Control Panel is located under the left engine housing cover. The following page illustrates and describes the controls and indicators.

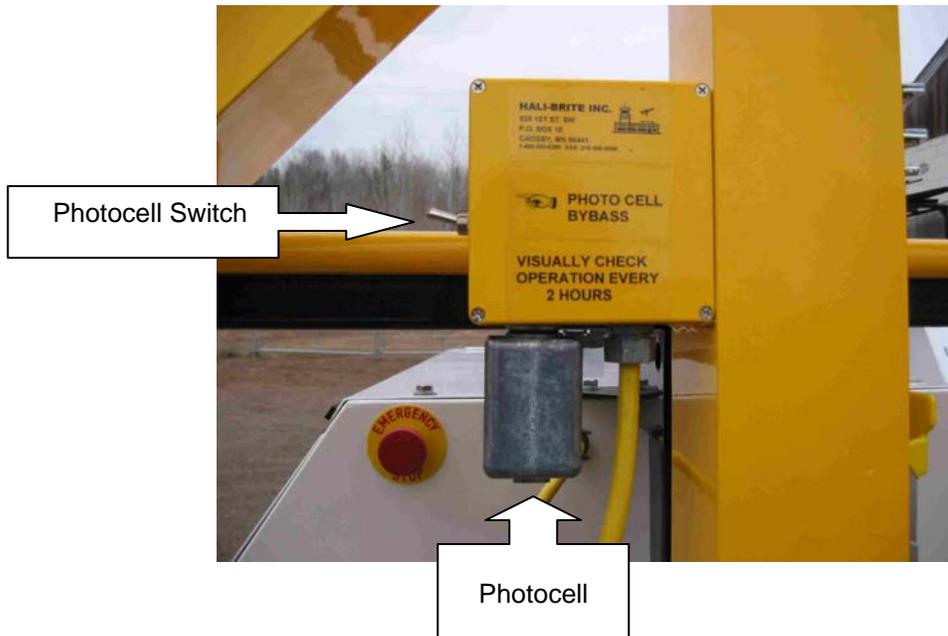
GENERATOR CONTROL PANEL



1. MAIN CIRCUIT BREAKER (30A). This breaker will disconnect power to the lights and auxiliary outlets. It will also disable the starting circuit if engine starting is attempted when the main breaker is on.
2. CIRCUIT BREAKER INDICATOR LIGHT. This light indicates that the main circuit breaker must be opened (switched off) before starting the engine.
3. OUTLET CIRCUIT BREAKER. These breakers are supplied for the 120V GFCI outlets and the 240V twist lock.
4. AUXILIARY OUTLETS. These supply power for accessories connected to the generator when the engine is running and the main circuit breaker is switched to the on ("I") position.
5. ENGINE STARTING SWITCH. Keyed switch operates glow plugs, starts and stops engine.
6. ENGINE GLOW PLUG INDICATOR. Indicates operation of the engine glow plugs.
7. ENGINE HOUR METER. Keeps track of engine hours for service.

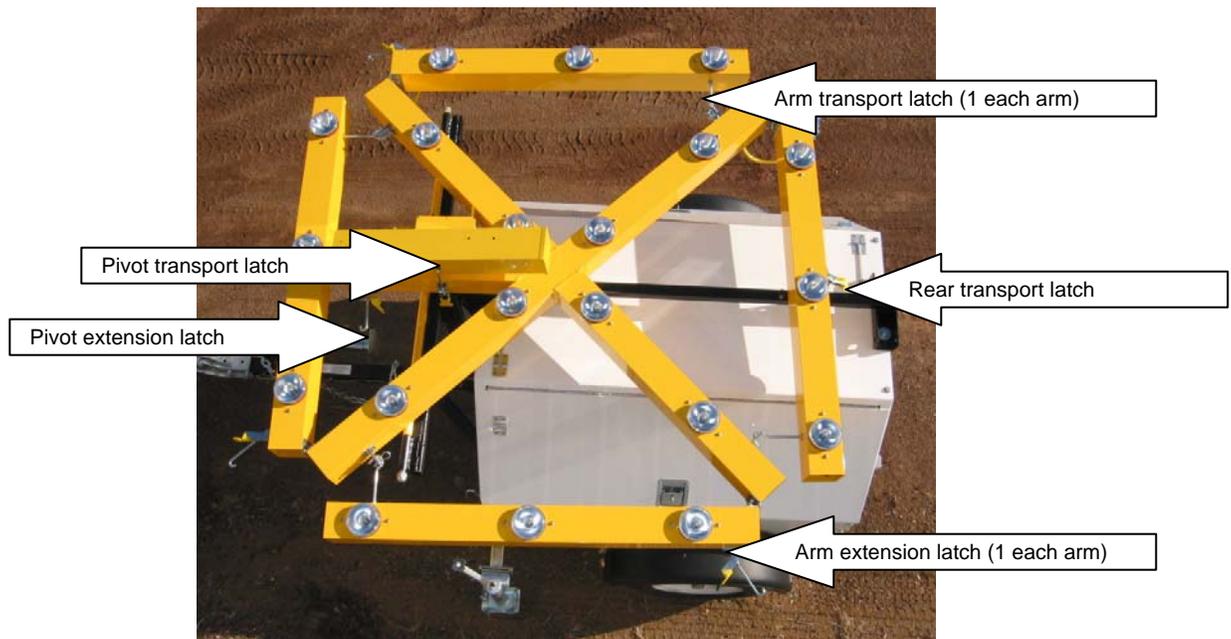
Light Control Panel

The Light Control Panel is located in the center of the light assembly. Refer to the following figure. The photocell is located on the bottom, and the photocell switch is located on the left side.



Light Assembly

The Light Assembly, viewed from above, in the transport (folded) position.



4 Initial Preparation

WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

Introduction

This section provides instructions for unpacking and preparing the RCM-D for initial use. Refer to the airport project plans and specifications for the runway-specific installation instructions.

Unpacking

The equipment is shipped ready for installation. Handle equipment very carefully to prevent component damage. Note any exterior damage to the product or shipping carton that might lead to detection of equipment damage.

If you note any damage to any equipment, **DO NOT CONTINUE TO UNPACK THE EQUIPMENT**. File a claim with the carrier immediately. The carrier may need to inspect the damage prior to further unpacking.

Unpack the unit as follows:

1. Locate the trailer tongue, on the pallet, at the front of the unit.
2. Remove the 2 bolts from the trailer tongue.
3. Attach the tongue to the trailer, using the 2 bolts, and tighten securely.
4. Remove the boards that hold the trailer jacks to the pallet.
5. Locate the operating and maintenance manuals. They are stored in a tube located inside the engine compartment.
6. **Thoroughly review the engine, generator, and RCM-D operating manuals before proceeding to operate the unit.**
7. Install the battery cable to the engine battery, fill with fuel, and check all fluid levels as advised in the Engine Operation Manual.
8. **Break in the engine for 50 hours, then change the oil and oil filter as described in the Engine Operation Manual. FAILURE TO OBSERVE BREAK-IN PROCEDURES MAY AFFECT YOUR ENGINE WARRANTY PROTECTION.** An oil filter has been provided for the first oil change.

Engine Starting and Operation

1. Check engine oil, fuel and coolant levels. Note: If the engine was run out of fuel or the fuel tank was drained, it may be necessary to bleed the fuel lines. Refer to the engine operation manual supplied with the unit.
2. Check the condition of the electrical cord on the inside of the unit.

WARNING!

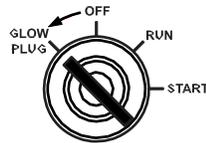
Do not start the unit if the insulation on the electrical cord is cut or worn through. Bare wires in contact with the mast or frame may energize the trailer and cause electrocution. Repair or replace cord.

3. Check that the main circuit breaker and individual circuit breakers for each of the lights is in the off “O” position. *Note: If the red light on the control panel “TURN MAIN BREAKER OFF” is illuminated when the key is turned to the “START” position, the breaker is closed (switched on).*

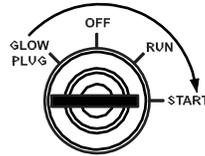
WARNING!
NEVER START THE ENGINE WITH ANY OF THE CIRCUIT BREAKERS SWITCHED ON! Any load on the generator during start up will cause severe damage or destroy the generator!

- Turn the key on the engine start switch to the left “GLOW PLUG” position and hold the key in place until the glow plug indicator turns red. As soon as it’s glowing turn the key to the right to the “START” position and hold it until the engine cranks and starts running. Release the key, it will move to the “RUN” position.

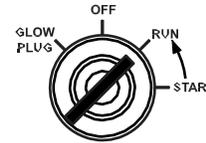
ACTIVATE GLOW PLUGS



CRANK ENGINE TO START



RELEASE KEY



CAUTION! Do not crank the engine longer than 10 seconds at a time. If the engine will not start, wait 30 seconds to allow the starter motor to cool and then repeat the starting procedure. Excessive cranking will cause damage to the starter.

- Note: If oil pressure is not obtained within 30 seconds after the key is switched to the “RUN” position, the low-oil automatic shutdown will turn off the fuel supply, stopping the engine. Check the oil level and turn the key to the “OFF” position to reset the oil pressure timer before attempting to restart the engine.*
- Once the engine is running, allow it to reach normal operating temperature before switching any loads.

Automatic Shutdown

This unit is equipped with a low oil pressure and high temperature auto-shutdown system. This system will automatically shut off the fuel supply to stop the engine if oil pressure drops too low or the engine exceeds normal operating temperature. Return the switch to the “OFF” position to reset the unit after you have determined the cause of the shutdown.

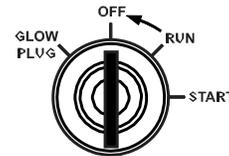
Derating for Altitude

All generator sets are subject to derating for altitude and temperature. Although derating should not affect the operation of the lights, it will reduce the available power for operating tools and accessories connected to the auxiliary outlets. Typical reductions in performance are 2-4% for every 1000 ft. (305 meters) of elevation and 1% per 10° F (3-5° C) increase in ambient air temperature over 72° F (22.2° C).

Shutting Down

When you have finished using the RCM-D, proceed with shut down as follows:

1. Remove any loads from the auxiliary outlets.
2. Switch the individual circuit breakers for each light to the off “O” position.
3. Switch the main circuit breaker to the off “O” position
4. Turn the ENGINE START SWITCH to the “OFF” position



Towing the Trailer

Once the engine is shut down and the light assembly is properly stowed, the trailer can be made ready for transport.

1. Raise the rear jack completely and release the locking pin to rotate it up into the travel position. Make sure the locking pin snaps into place.
2. Raise the outrigger jacks completely and release the jack locking pin to swing the jacks up into the travel position. Make sure the locking pins snap into place. Release the outrigger locking pins and slide the outriggers into the trailer frame until the locking pins snap into place.
3. Use the drawbar jack to raise or lower the trailer onto the hitch of the towing vehicle. Lock the hitch coupling and attach the safety chains or cables to the vehicle. Release the jack locking pin and rotate the jack into the travel position. Make sure the locking pin snaps into place.
4. Connect any trailer wiring to the tow vehicle. Check for proper operation of the stop and signal lights.
5. Maximum recommended speed for highway towing is 45 m.p.h. Recommended off-road towing speed is not to exceed 10 m.p.h. or less depending on terrain.

Daily Inspection

1. Inspect condition of electrical cords. **Do not** use the light assembly if insulation is cut or worn through.
2. Check the fuel, oil and coolant levels. Check tire inflation pressure.
3. Check the wheel lugs tighten or replace any that are loose or missing. If a tire has been removed for axle service or replaced, tighten the lugs to the following specifications:
 - A. Start all lug nuts by hand.
 - B. First pass tighten to 20-25 Ft-Lbs (27-33 Nm).
 - C. Second pass tighten to 50-60 Ft-Lbs (67-81 Nm).
 - D. Third pass tighten to 90-120 Ft-Lbs (122-162 Nm).
 - E. After the first road use, re-torque the lug nuts in sequence.

Trailer Wheel Bearings

The light tower is equipped with a grease zerk fitting to allow lubrication of the wheel bearings without the need to disassemble the axle hub. To lubricate the axle bearings, remove the small rubber plug on the grease cap, attach a standard grease gun fitting to the grease zerk fitting and pump grease into the fitting until new grease is visible around the nozzle of the grease gun. Use only a high quality grease made specifically for lubrication of wheel bearings. Wipe any excess grease from the hub with a clean cloth and replace the rubber plug when finished. The minimum recommended lubrication is every 12 months or 12,000 miles; more frequent lubrication may be required under extremely dusty or damp operating conditions.

Engine Maintenance

The periodic Maintenance Schedule below lists basic maintenance intervals for the engine. For detailed maintenance procedures refer to the *Engine Operator's Manual*. A copy of this manual was supplied with the unit when it was shipped from the factory. For additional or replacement copies of the Engine Operator's Manual contact an authorized engine dealer in your area.

	Daily	Every 250 hours	Every 500 hours	Every 1000 hours	Every 2 years		
Check engine oil, coolant, air cleaner.	X						
Change engine oil.*		X					
Clean air cleaner element.			X				
Clean fuel filter.		X					
Check level of battery electrolyte.				X			
Check condition and tension on fan belt.			X				
Replace oil filter.*		X					
Check condition of radiator hoses.			X				
Replace fuel filter.			X				
Remove sediment in fuel tank.					X		
Flush radiator.					X		
Check fan belt.			X				
Check all electrical connections.			X				
Change radiator coolant.					X		
Check valve clearance.					X		
Check radiator hoses and clamps.				X			
Check fuel pipes and clamps.				X			
Replace air cleaner element.	Once a year or every six cleanings.						

* Change engine oil and filter after first 50 hours of operation.

5 Installation

Introduction

This chapter describes how to set up an RCM-D at the operating site, maintenance procedures during operation, and take-down procedures at the conclusion of operation.

NOTE:

- 1. Read and understand all operating manuals.**
- 2. Break in the engine as described in the Engine Operating Manual.**
- 3. Become familiar with setting up and taking down the RCM-D prior to installation.**

Set Up Procedure

1. Review the maintenance schedule, fill the fuel tank, and check all engine fluids.
2. Tow the RCM-D to the desired location.
3. Disconnect the RCM-D from the tow vehicle and move the tow vehicle away.
4. Orient the RCM-D directly in line with the runway.
5. Adjust the height of the drawbar leveling jack so the RCM-D is approximately level, front-to-rear.
6. Lower the rear leveling jack to firmly touch the ground, as shown below. Do not raise the rear of the unit.



7. Release the retaining pins on each side leveling jack outrigger, and pull the outrigger out until the retaining pin locks into position, as shown below.



8. Lower each side-leveling jack until it firmly touches the ground.
9. Continue lowering one of the side leveling jacks until the tire on that side is about 1 inch off the ground.
10. Lower the other side-leveling jack until the tire on that side is about 1 inch off the ground.
11. Lower the rear-leveling jack until the desired elevation is reached, as indicated

on the elevation gauge located on top of the rear of the engine housing. See below. (The elevation is typically set to 3 degrees.)



12. Raise the drawbar jack, and rotate it to the stowed position.

NOTE: The drawbar jack is stowed during RCM-D operation.

13. Unlatch the rear light assembly transport latch, located on top of the rear engine housing, as shown below.



14. Remove the hairpin key from the transport latch on each of the 4 light assembly arms.
15. Lift the handle on one of the arm transport latches, and swing the arm towards the open position. When almost fully open, release the handle on the second arm transport latch and let it swing open. Latch the extension latch on the first arm, as shown below.



16. Unlatch the rest of the 4 arms and lock them into position with the extension latches.
17. Unlatch the pivot arm transport latch, and swing it into position.

18. Latch the pivot arm extension latch, as shown below.



19. Push down on the pivot arm. The light assembly will raise to an upright position, as shown below.



20. Continue pushing the pivot arm until the pivot arm striker engages and locks into the latch on the support post, as shown below.



21. Install the latch safety pin into the hole in the latch bar.

22. Open the left engine cover and locate the engine control panel, as shown below.



23. Make sure both circuit breakers are in the off position.
24. Start the engine per the instructions on top of the control panel.
25. Turn on the main breaker and the light/heater breaker. The light assembly will illuminate and begin flashing.
26. The lamp intensity will be at the low (night) level for approximately 15 seconds on startup. Then, if the ambient light is sufficient, the lamps will change to the high (day) intensity.
27. Close the engine cover.
28. Set the photocell switch on the light assembly control box to the desired position. Turn the switch to the OFF position (down) for continuous operation at high intensity. Turn the switch to the ON position (up) for automatic dimming at night. See the photo below.



Maintenance During Operation

1. Check lamp operation every 2 hours, replace lamps as necessary. For LED lamp version all LEDs must remain lit during operation. If any individual LEDs are inoperable the lamp module must be replaced.
2. Refuel every 120 hours of operation.
3. Check engine oil and coolant levels after every fuel fill.
4. Check to ensure all light assembly latches are tight.
5. Check the engine hour meter, perform maintenance per the Engine Operating Manual.

Take Down Procedure

1. Open the engine cover and turn off the main breaker and the light/heater breaker.
2. Turn off the engine and close the engine cover.
3. Remove the latch safety pin from the latch bar.
4. Grasp the light assembly pivot arm, near the base. Using your other hand, pull the latch bar until it disengages the pivot arm. The light assembly will begin to swing into the transport position. Continue to lower the light assembly to the transport position, as shown below.



5. Unlatch the light assembly pivot arm extension latch, as shown below.



6. Swing the pivot arm up and over the light assembly, into the transport position.
7. Latch the pivot arm transport latch.
8. Unlatch each of the four light assembly arm extension latches.
9. Swing each of the four arms to the transport position, making sure each arm transport latch is firmly engaged.
10. Install the hairpin cotter pin in each of the four arm transport latches.

NOTE: Failure to install the transport latch cotter pins may cause the light assembly arms to become unlatched during transport.

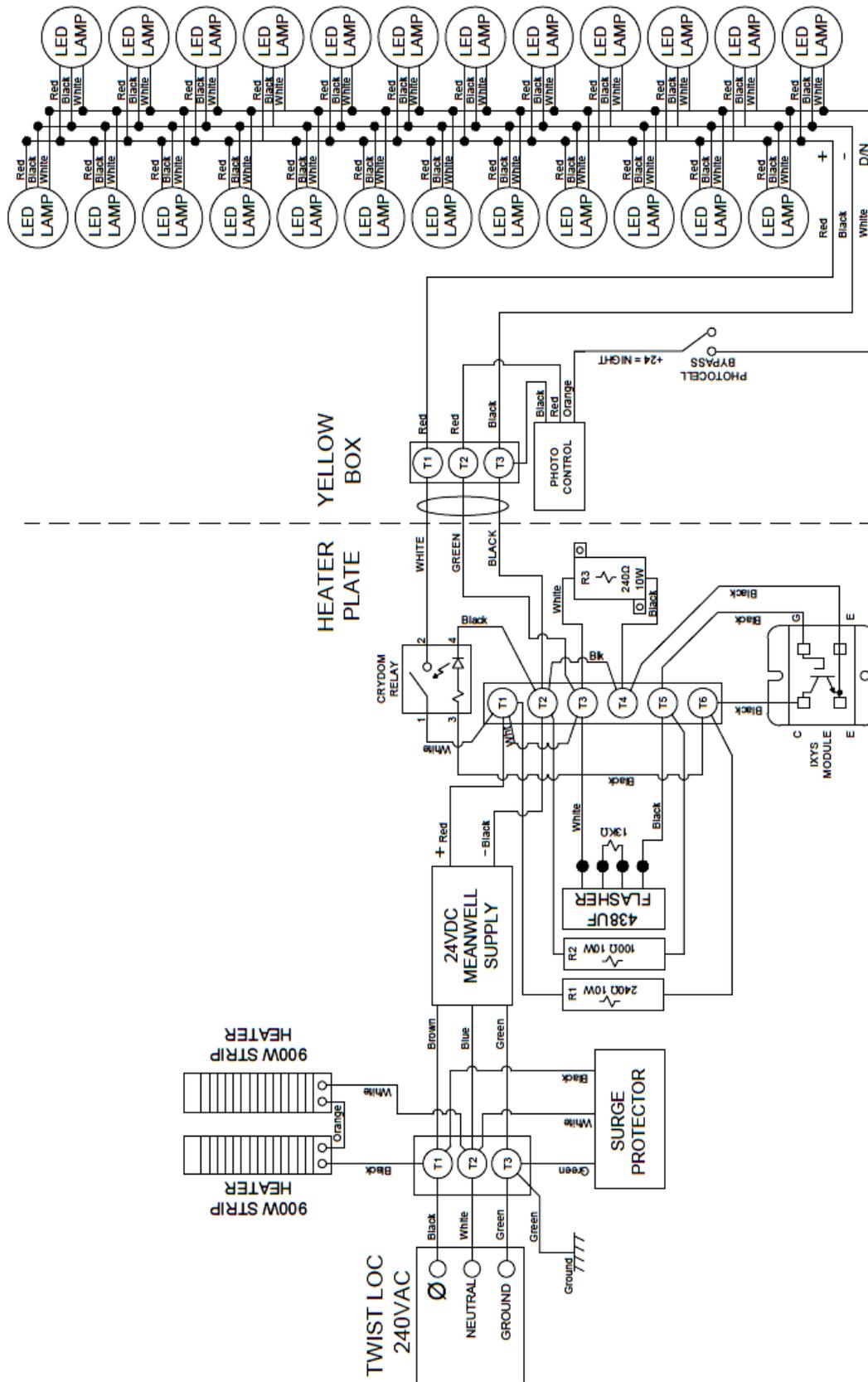
11. Latch the rear light assembly transport latch, as shown below.



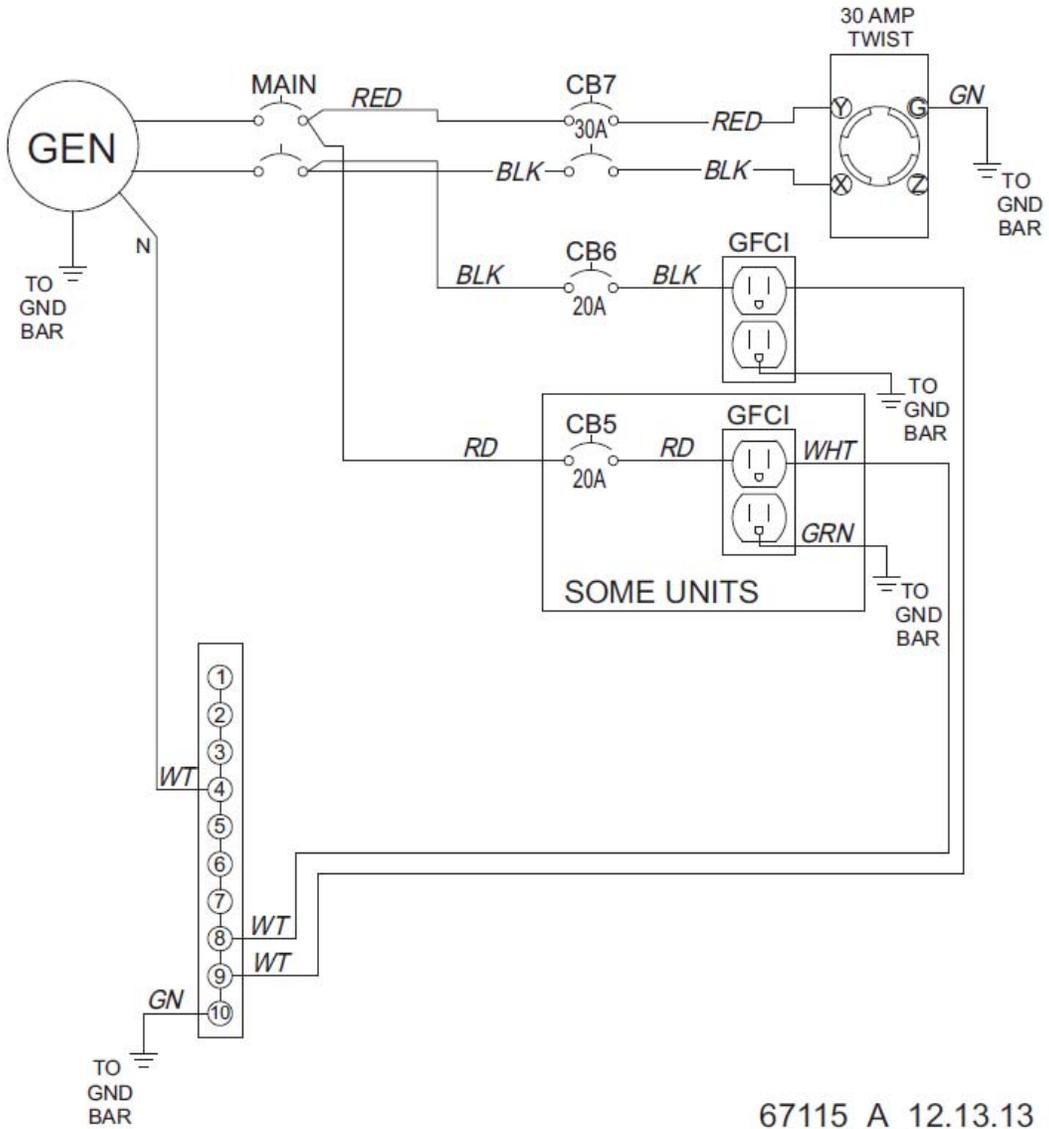
12. Swivel the drawbar jack into position, and lower it until it touches the ground.
13. Raise the rear leveling jack and swivel it into the transport position.
14. Raise one of the side leveling jacks until it clears the ground. Slide the outrigger into the transport position, making sure the outrigger latch is engaged.
15. Raise the other side leveling jack until it clears the ground, and slide the outrigger into the transport position.
16. Attach the RCM-D to the tow vehicle.
17. Ensure all latches are tight and secure.

6 Wiring Diagrams

LIGHT ASSEMBLY WIRING

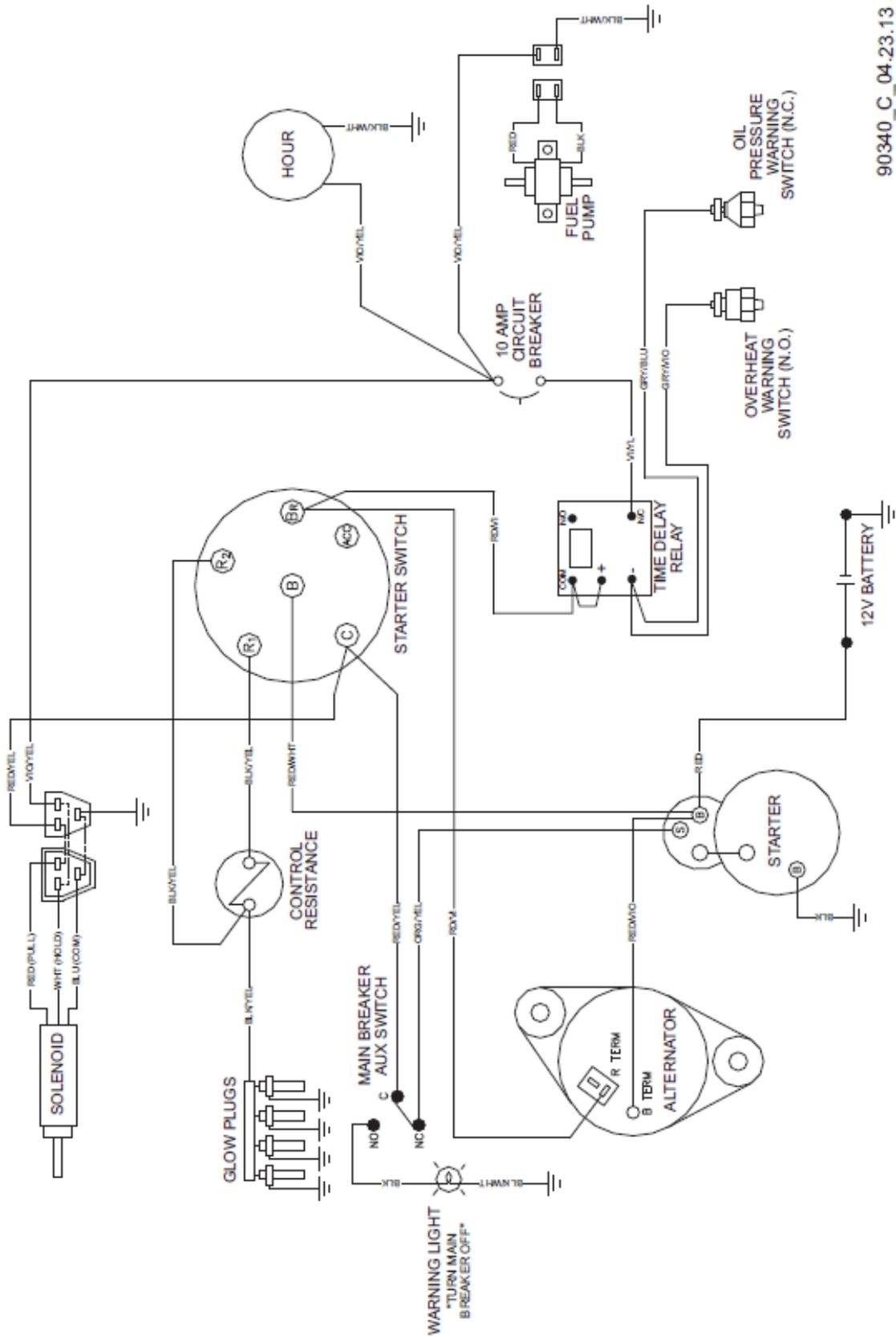


AC WIRING



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DC WIRING



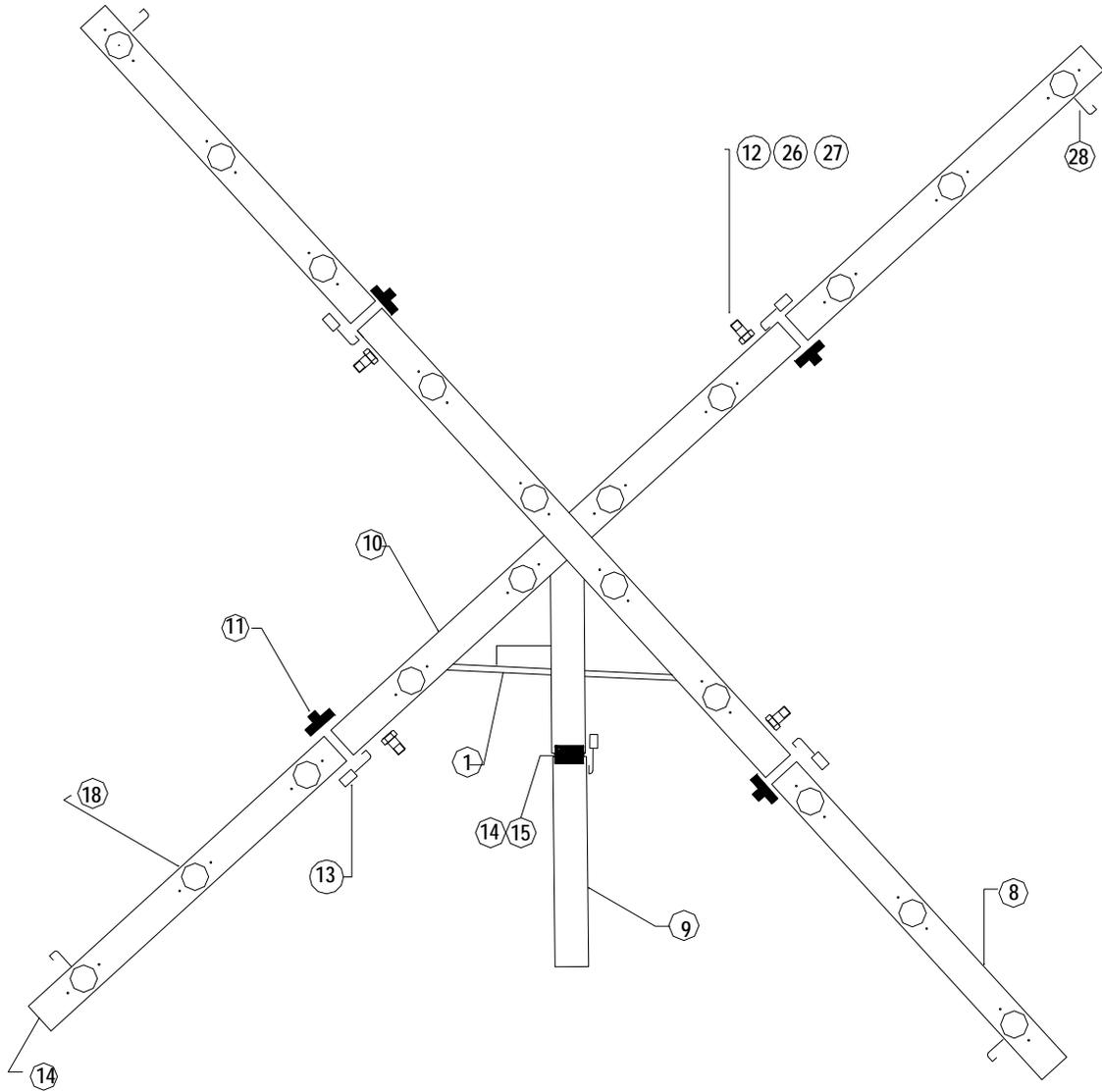
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7 Replacement Parts

Recommended Spares

Hali-Brite® Part Number	Item Description
M-16444	AIR FILTER
M-17647	FUEL FILTER after S/N1373
M-16687	UPPER RADIATOR HOSE
M-16688	LOWER RADIATOR HOSE
M-16691	OIL FILTER
M-16692	ALTERNATOR BELT
M-16693	GLOW PLUG
M-13000	BEARING SEAL

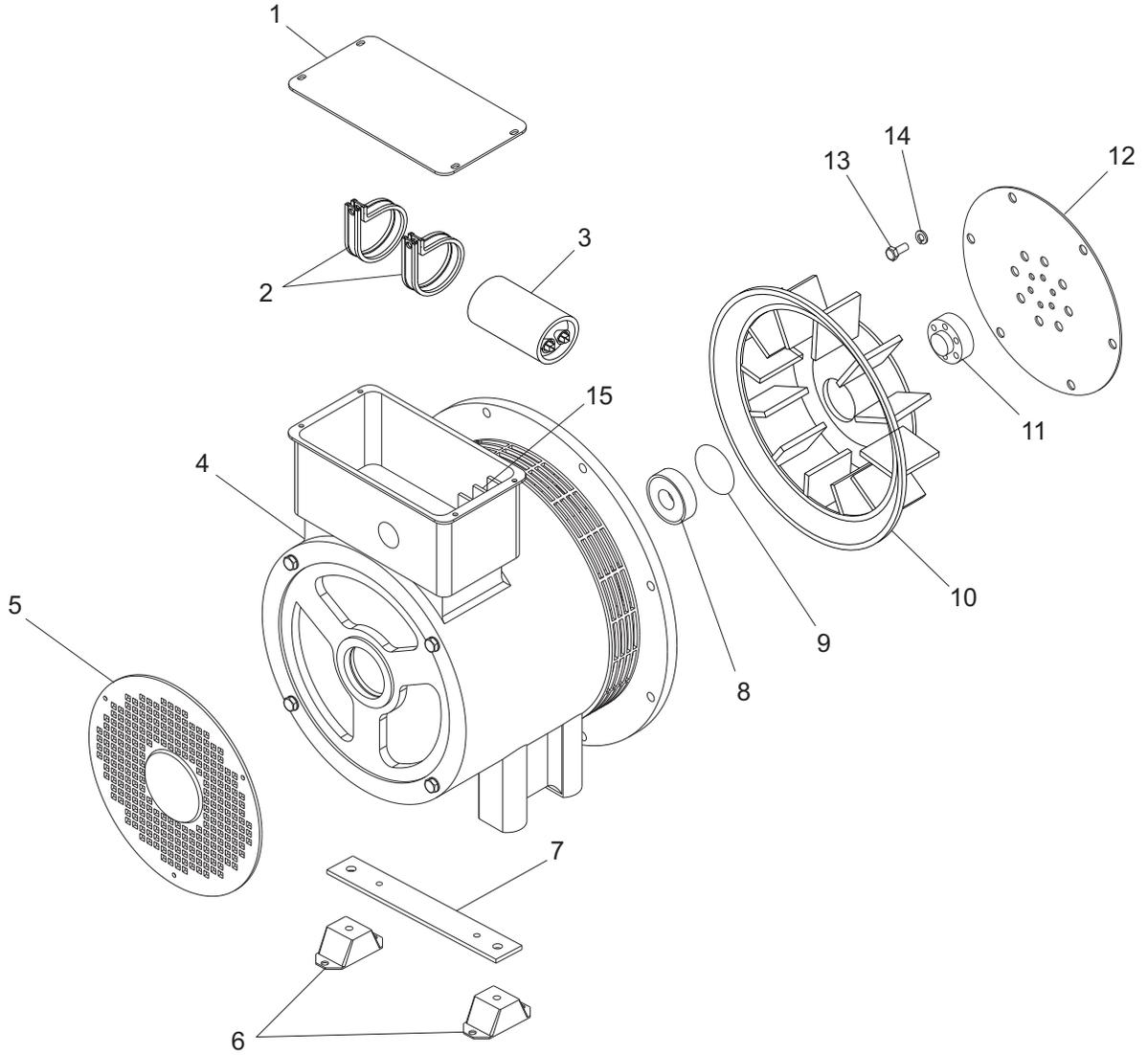
LIGHT ASSEMBLY



LIGHT ASSEMBLY

Item Number	Hali-Brite® Part Number	Description
1	0100-3779	Light Assembly Pivot Axle, 3/4" x 52"
	0100-3937	RCM-D LED X LIGHT ASSY, COMPLETE
	0100-3781	X Support Assembly
	0100-3773	Inclinometer
8	0100-3747	RCM Arm
9	0100-3749	RCM Lower Pivot Arm
10	0100-3767	RCM Center Weldment
11	0100-3768	Hinge, 3" W x 4" H
12	1500-0022	Gravity Gate Latch
13	1500-0023	Draw Catch, Adjustable
14	0100-3778	Aluminum End Cap, 4x4
15	7300-0015	Polyurethane Strip
18	0100-3930	LED Lamp Module
	6200-0030	SWITCH, SPST Toggle
	7800-0009	Photo-Cell, Lumitrol, 24Vdc
	5200-0097	Flasher Timing Module
26	8200-0006	Lanyard
27	1400-0023	Hairpin Cotter
	0100-3770	Bumper
	1016-0017	Plug, Twist-Loc, NEMA L6-30P
28	0900-0073	J-Hook

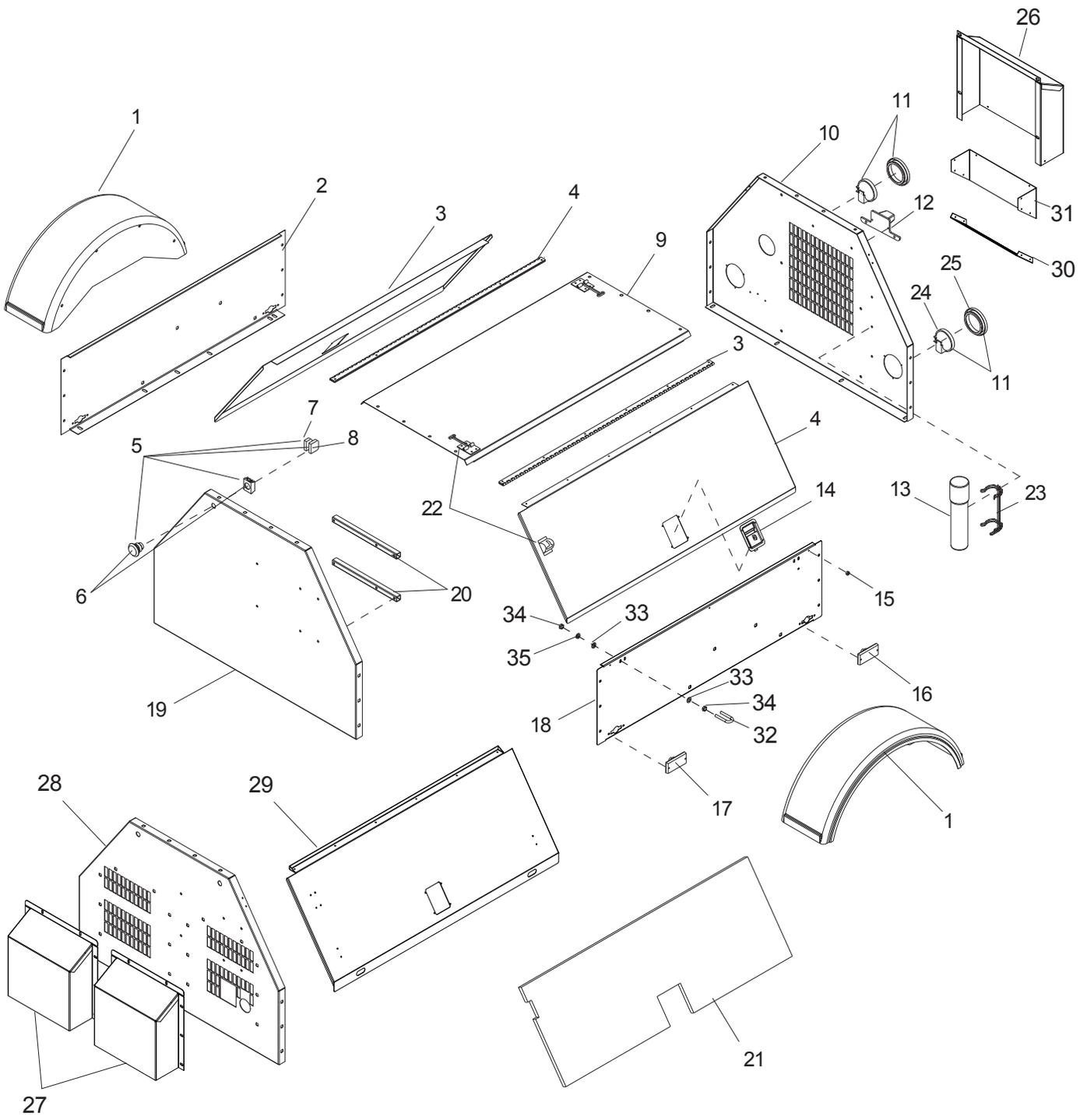
6 KW GENERATOR ASSEMBLY



ITEM	PART	QTY	DESCRIPTION	NOTES
1	12736	1	Marathon gen box cover, 6KW-20KW	
2	16395	2	Capacitor clamp	
3	12159	1	Capacitor, 25 μ F Marathon 6KW	
	15695	1	Capacitor, 45 μ F Marathon	
4	16556	1	Generator, 6 kW 60Hz capacitor	Items 1-5 and 8-15
5	12327	1	Marathon 6KW pancake case cover	
6	15241	2	Compression mount, engine/generator	
7	15045	1	Generator mounting bar	
8	12328	1	Marathon 6KW pancake bearing	
9	12329	1	Marathon 6KW pancake bearing seal	
10	12527	1	Fan, Marathon 6KW gen (model 201)	
	16421	1	Generator fan blade 6KW (model 332)	
11	11339	1	Generator drive plate spacer	
12	16123	1	Plate, drive - SAE 6.5	
13	60410	6	Screw, M8x1.25x16 hx hd	
14	60029	6	Washer, split lock M8	
15	12916	1	Marathon, 6/8kw terminal block	

Note: Engine and generator parts used in all Magnum Products LLC equipment carry the Original Equipment Manufacturer (OEM) warranty unless otherwise stated. OEM warranty parts must be purchased through an OEM dealer. Please contact Magnum Products LLC with questions.

ENCLOSURE ASSEMBLY - MLG 8



ITEM NO.	PART NO.	QTY	DESCRIPTION
1	16560	2	Fender, plastic - single wall
2	12025W	1	Panel, right side sheet metal
3	16591W	2	Panel, door
4	16598	2	Hinge, door - .188 pin, 48.5 long
5	22550	1	Switch, estop, 2NO/1NC (assembly)
6	65470	1	Switch, e-stop operator
7	65580	1	Block, e-stop contactor - N.C.(low voltage)
8	65584	1	Block, e-stop contactor - N.O / N.O
9	16538W	1	Panel, top
10	11684W	1	Panel, rear
11	10219	2	Assy, rear tail/turn light
12	10223	1	Assy, license plate light/bracket
13	11121	1	Tube, black manual holder, 14"
14	15123	2	Latch, paddle
15	15215	6	Bumper, rubber
16	65406	2	Light, clearance marker - red
17	65407	2	Light, clearance marker - amber
18	11677W	1	Panel, left side MLG 6/8 kW
19	12012W	1	Panel, front sheet metal
20	11543B	2	Spacer, control box
21	11724	2	Foam, door
22	12605	2	Latch, door SS - T-style
23	11222	1	Bracket, manual holder
24	10220	2	Light, rear tail/turn, no grommet
25	10221	2	Grommet, rear light, rubber 4.5"

OPTIONAL FEATURES

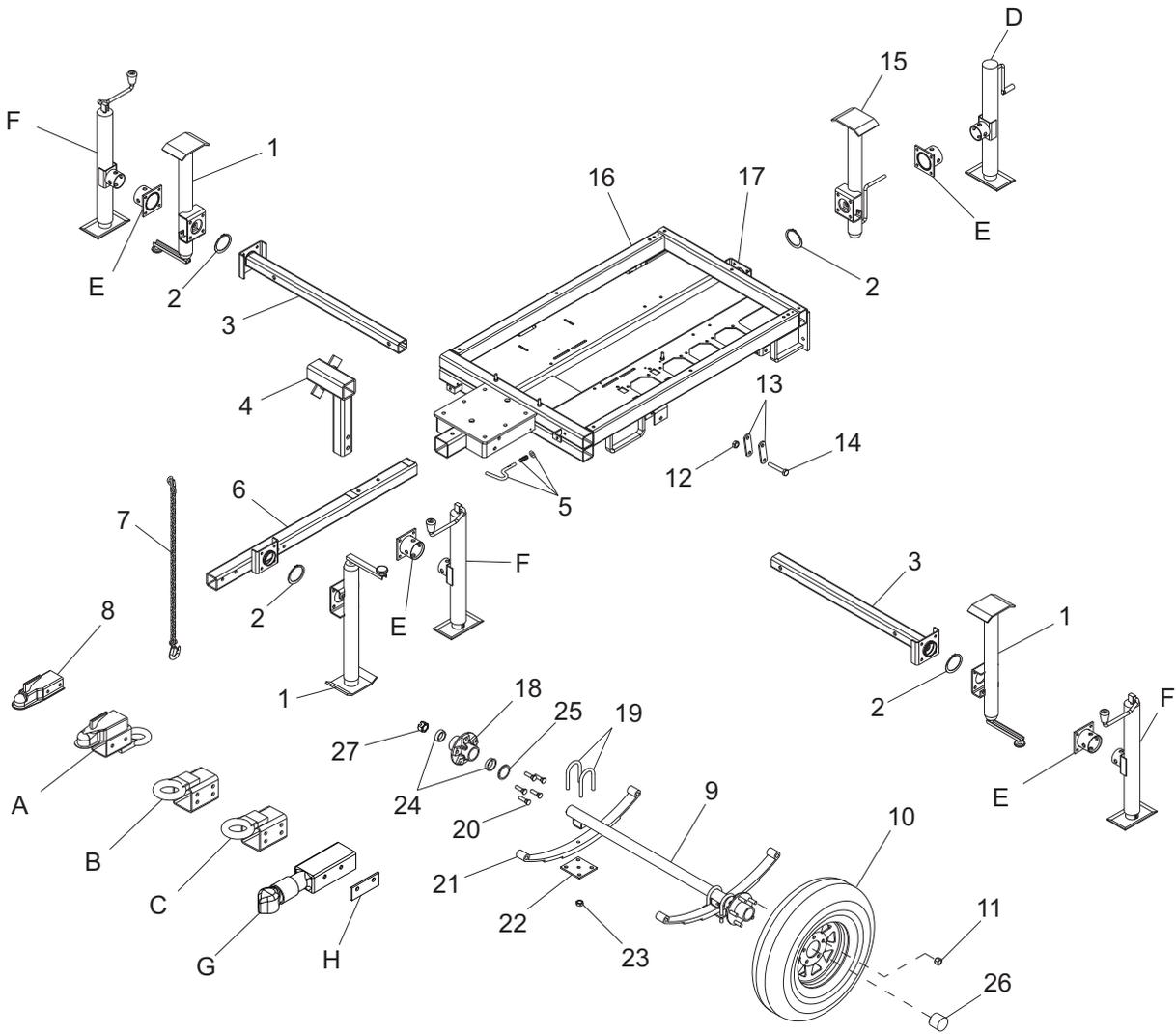
For Containment/Silent Pack:

26	12189W	1	Duct, radiator guard
27	16469W	2	Duct, front
28	12754W	1	Panel, front 4000 containment

For Tamper Pack:

29	16739W	2	Panel, door - U bolt lock
30	12837W	1	Grate, duct - white
31	13868W	1	Panel, duct grate bracket - tamper pack
32	60200	2	Bolt, U .250-20 X .750 X 1.25
33	60243	8	Washer, .250 flat .735/.060 USS
34	60284	8	Nut, .250-20 hex G5
35	60286	4	Washer, .250 split lock

FRAME ASSEMBLY

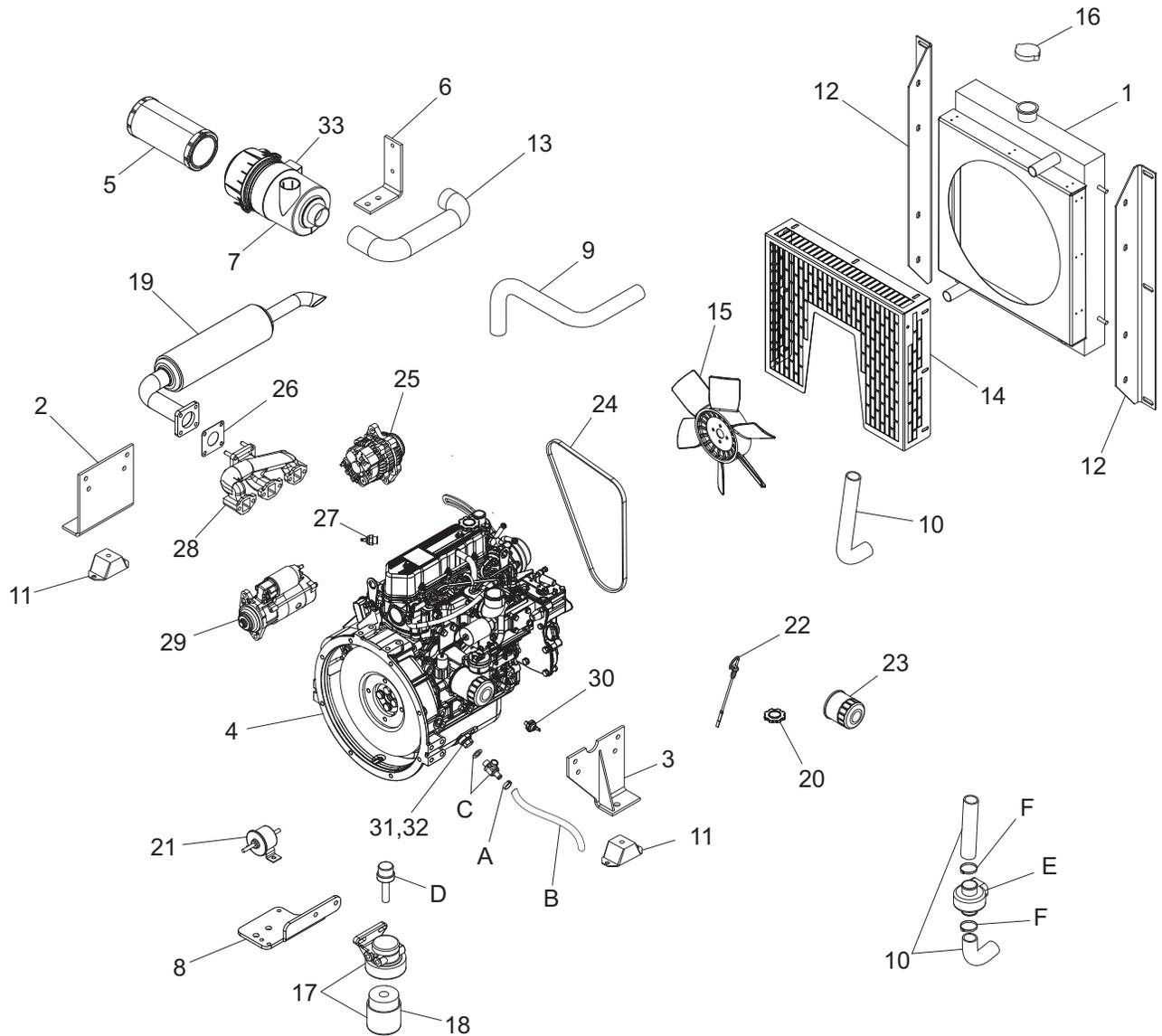


ITEM	PART	QTY	DESCRIPTION	NOTES
1	11682	3	Jack, top wind - 2000 lb.	
2	14326	4	Ring, retaining	
3	12431Z	2	Weldment, outrigger	
4	12235B	1	Weldment, spare tire holder	
5	14324	2	Kit, plunger	
6	12420B	1	Weldment, removable tongue	
7	23367	2	Chain, safety - 7,800 lbs. rated	
8	16830	1	Coupler, 2.00 ball/2.50 channel	
9	11100	1	Assembly, axle - 2200 lb.	Items 18-27
10	15976	2	Wheel, 13"	
11	60096	10	Nut, .500-20 wheel lug	
12	60504	6	Nut, .562-18 hx shackle lock	
13	19637	4	Plate, shackle bracket	
14	60503	6	Screw, .562-18 hx shackle	
15	11681	1	Jack, side wind - 2000 lb.	
16	13819B	1	Weldment, LT chassis	
17	11221	1	Bracket, jack mounting - 1.25 deep	
18	11206	2	Hub w/studs and outer races	
19	11201	4	U-bolt 2200 lb.	
20	11207	10	Wheel stud .500-20	
21	16679	2	Spring - 25 in. 2200 lb.	
22	11202	2	Tie-plate 2200 lb.	
23	11203	8	Nut (U bolt) 2200 lb.	
24	11511	4	Roller bearing	
25	13000	2	Seal - 2200 lb.	
26	12460	2	Wheel bearing cap	
27	12308	2	Spindle nut	
A	16741B	1	Weldment, combo hitch - 2.50 tongue	Option
B	16835B	1	Weldment, lunette ring - 3.00 ID	Option
C	16999B	1	Weldment, lunette ring - 2.50 ID	Option
D	13050	1	Jack assembly, 3000# side wind	Option
E	11965Z	4	Weldment, jack adapter	Option
F	13051	3	Jack assembly, 3000# top wind	Option
G	13003B	1	Coupler, 2.00 ball/3/00 channel	Option: Bulldog hitch
H	12155B	1	Spacer, coupler - black	Option: Bulldog hitch

Items not Shown

15142	1	Fitting, .250NPT x .312 hose barb
16271	1	Fitting, 90-.250NPT x .188 barb
162 70	1	Fitting, .375MNPT x .250FNPT
12080	1	Cap, fuel tank vented - 3.5 in. green
13616B	2	Strap, fuel tank - 30 gal tank w/sump
12361B	1	Weldment, fuel tank strap
12359B	1	Weldment, fuel tank strap (large)

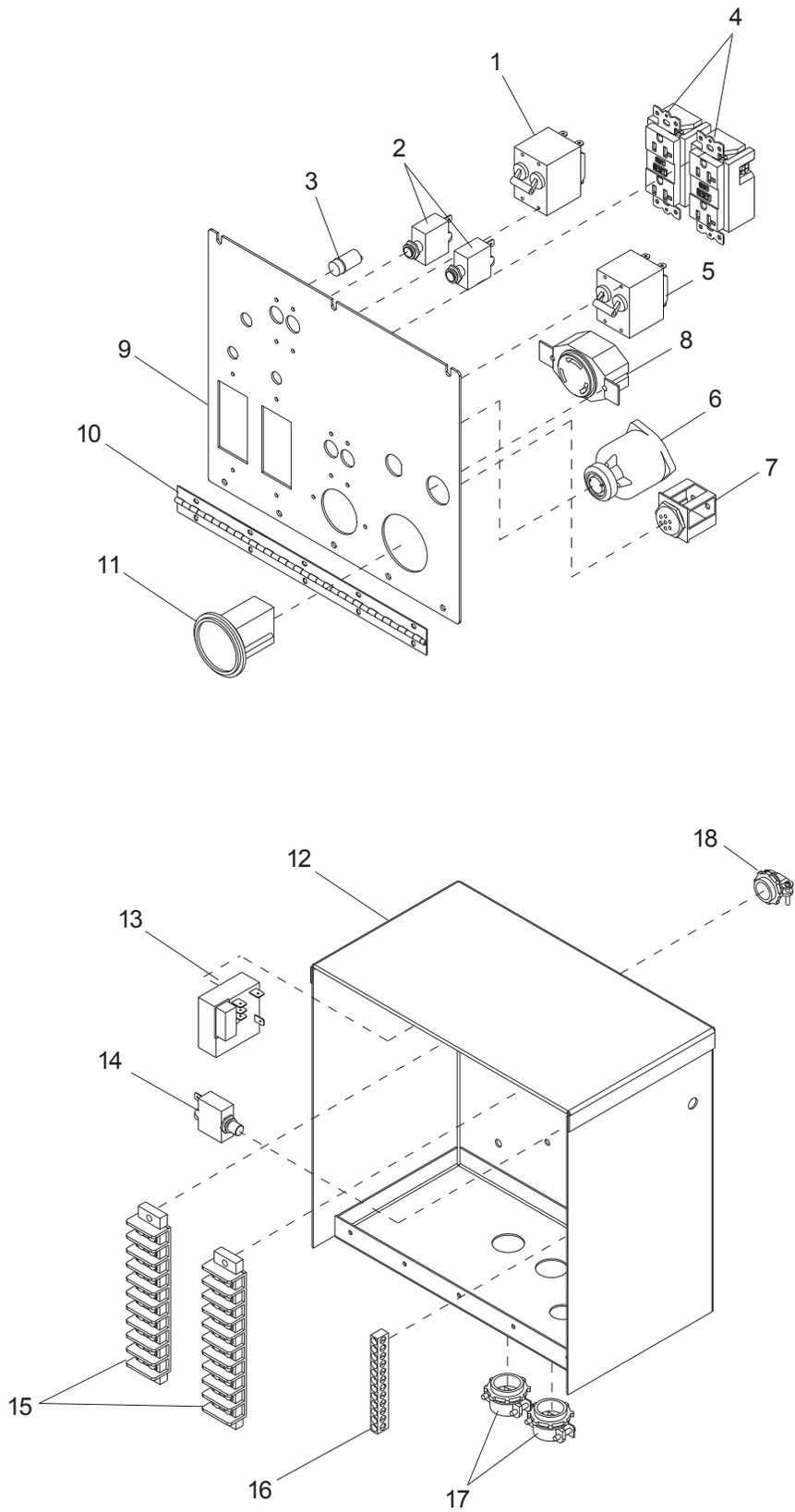
MITSUBISHI ENGINE ASSEMBLY



Note: Engine and generator parts used in all Magnum Products LLC equipment carry the Original Equipment Manufacturer (OEM) warranty unless otherwise stated. OEM warranty parts must be purchased through an OEM dealer. Please contact Magnum Products LLC with questions.

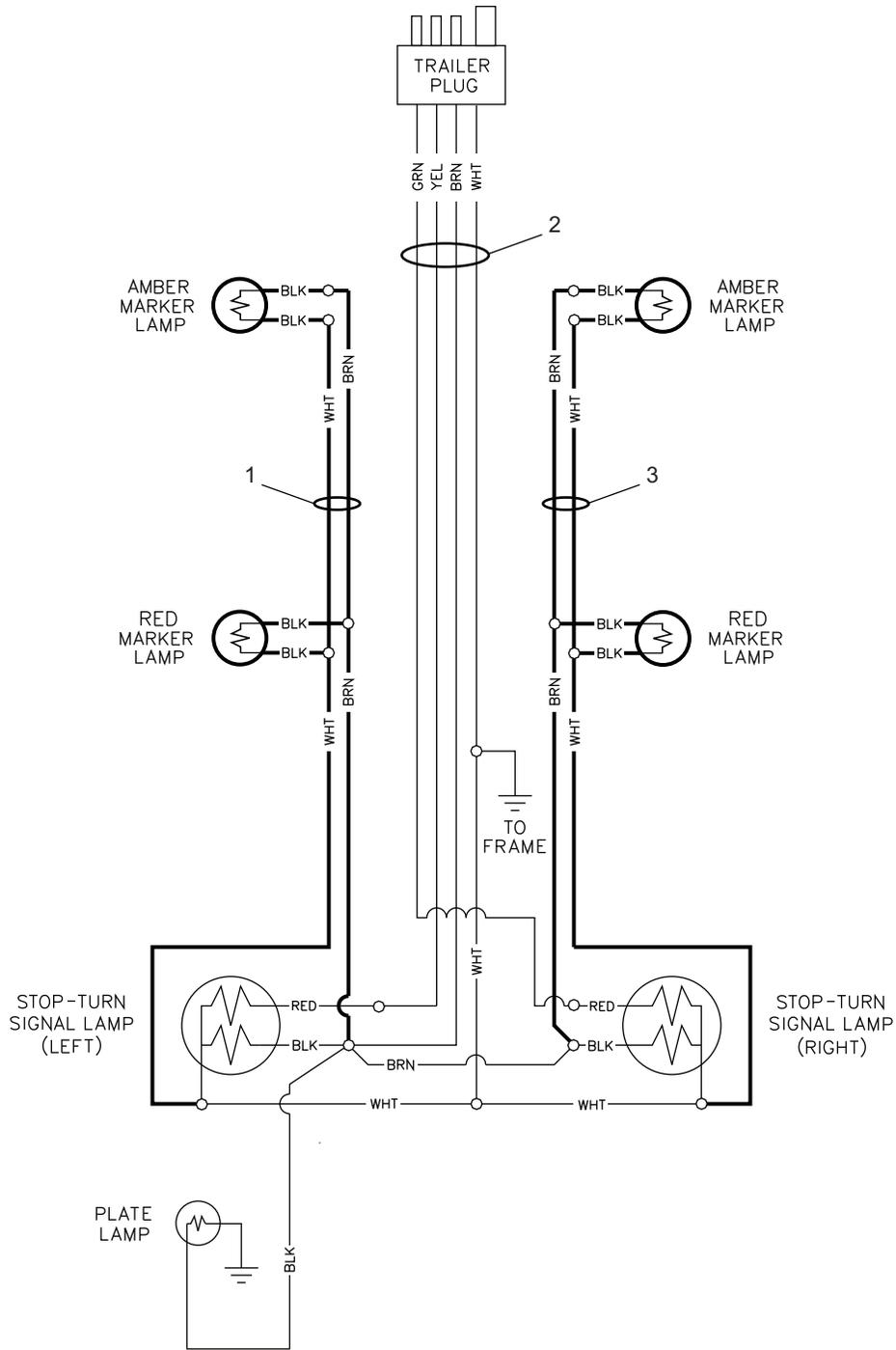
ITEM	PART	QTY	DESCRIPTION	NOTES
1	13924	1	Radiator w/fan guard - welded	
2	16554B	1	Weldment, engine mount - LH	
3	16553B	1	Weldment, engine mount - RH	
4	13046	1	Engine, Mitsubishi - L3E int. Tier IV	
5	16444	1	Element, air filter	
6	16551B	1	Bracket, air cleaner	
7	16443	1	Filter, air with bracket	
8	12838B	1	Bracket, fuel filter/pump	
9	16687	1	Hose, radiator upper	
10	16688	1	Hose, radiator lower	
11	15241	4	Mount, compression	
12	11135B	2	Bracket, radiator	
13	16589	1	Hose, air cleaner	
14	11413	1	Guard, fan	
15	16742	1	Fan, engine	
16	19219	1	Cap, pressure radiator	
17	17641	1	Fuel filter head & element (new)	Start SN: 1003181
	16685	1	Fuel filter head & element	End SN: 1003180
18	17647	1	Element, fuel filter (new)	Start SN: 1003181
	16686	1	Element, fuel filter	End SN: 1003180
19	13710	1	Muffler, engine	
20	11147	1	Cap, oil filler	
21	13278	1	Fuel pump, electric	
22	11148	1	Dipstick, engine oil	
23	16691	1	Filter, oil	
24	16692	1	V-belt, alternator	
25	16743	1	Alternator, Mitsubishi	
26	11042	1	Gasket, exhaust manifold	
27	16678	1	Switch, coolant temperature	
28	12529	1	Manifold, exhaust	
29	16833	1	Starter assy, engine	
30	16677	1	Switch, oil pressure	
31	12888	1	Plug, oil drain	
32	12889	1	Gasket, oil drain	
33	16445	1	Bracket, air cleaner housing	
--	16683	1	Solenoid, fuel shut-down	Not shown
--	16693	3	Glow plug, engine	Not shown
--	15074	1	Cable, battery red 38"	Not shown
--	12568	1	Cable, battery black 27"	Not shown
--	16744	1	Water pump, Mitsubishi	Not shown
--	12213	1	Mitsubishi, gasket, water pump	Not shown
--	16745	1	Thermostat, Mitsubishi	Not shown
--	12214	1	Gasket, thermostat	Not shown
--	12959	1	Mitsubishi, gasket, intake manifold L3E	Not shown
--	12214	1	Mitsubishi, gasket, thermostat	Not shown
--	16874	1	Assy, engine harness	Not shown
--	11366	1	Solenoid, starter Mitsubishi	Not shown
--	11367	1	Manifold stud	Not shown
A	60777	1	Clamp, hose - .312 fuel hose crimp style	Option
B	12227	1	Hose, oil drain .375 X 20, 30R7	Option
C	60766	1	Valve, drain 18MM-1.5 w/nipple	Option
D	13876	1	Kit, heater - fuel filter	Option
E	65649	1	Heater, engine - low rad hose	Option
F	62245	2	Clamp, hose - constant torque .813-1.75	Option
--	10699	1	Cable, battery - 24" 4ga blk- 3/8" lug	Option: Batt. disc. - Not Shown
--	10386	1	Belt, cold weather - Mitsu 6KW & 8KW	Option: Not Shown
Items Not Shown				
	19714	1	Cap, overflow bottle	
	20287	1	Jug, overflow 2 qt (.5 gal.)	

CONTROL BOX ASSEMBLY - MLG 8



ITEM NO.	PART NO.	QTY	DESCRIPTION
1	65864	1	Breaker, 40A, 250V 2-pole, screw terminals
2	65849	2	Breaker, 20A, 120V, 1 pole push button
3	65388	1	Light, indicator red - w/wire 12 volt DC
4	14130	2	Receptacle, 120V/20A GFI
5	65963	1	Breaker, 30A, 250V, 2pole, screw term w/ aux
6	15195	1	Switch, key - Isuzu, Mitsu
7	16694	1	Indicator, glow plug
8	14137	1	Receptacle, 240V/30A twist (L6-30R)
9	10679	1	Panel, control
10	13677	1	Hinge, continuous - 11.00
11	15085	1	Gauge, hourmeter
12	13666B	1	Box, control
13	14201	1	Relay, 15 sec fixed delay, 12VDC, 10 amp
14	14841	1	Breaker, push button - 10 amp
15	14203	2	Block, terminal - 10 pos.
16	14204	1	Kit, ground bar
17	14219	4	Strain relief - .75 Romex w/nut
18	14202	5	Strain relief - .375 Romex w/nut

WIRING HARNESS ASSEMBLY



ITEM	PART	QTY	DESCRIPTION	NOTES
1	10267	1	Harness, left side trailer	
2	10262	1	Assy, trailer light harness	
3	10266	1	Harness, right side trailer	
-	65441	-	Adapter, pig-tail trailer light 4-pin to 12-pin	
-	65465	-	Adapter, trailer wiring flat 4 to rnd 7 blade	
-	65464	-	Adapter, trailer wiring flat 4 to rnd 7 pin	
-	65463	-	Adapter, trailer wiring flat 4 to rnd 6 pin	
-	65548	-	Adapter, 4 pin flat to 4 pin flat x 12.00	

